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(12) **United States Patent**
Ndumu et al.

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(54) **SOFTWARE SYSTEM GENERATION**

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(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

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(52) **U.S. Cl.** **717/1**; 709/202; 709/316; 709/317; 706/49; 706/50; 706/59; 706/922

(58) **Field of Search** 706/47, 49, 50, 706/60, 62, 914, 919, 92.2, 59; 717/1–4, 10; 709/102, 104, 106, 202, 227, 317, 316, 328, 332; 705/80; 707/10, 104

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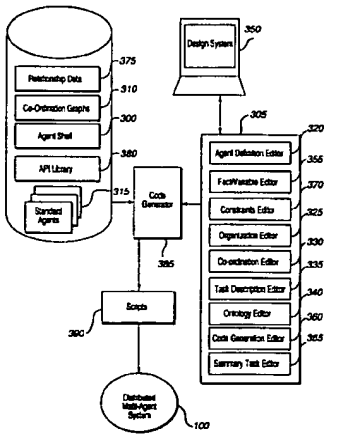
(57) **ABSTRACT**

A system for building collaborative software agents is provided with a set of editors for capturing data for installation in the individual agents. The collaborative software agents will normally form a community, including some standard agents, provided by the system, and will collaborate to provide functionality in a domain selected by the user. Each collaborative software agent built by the system is provided with co-ordination policies, selected by the user, and represented by a co-ordination graph. A single collaborative software agent can be provided with more than one collaborative policy and is capable of running more than one collaborative policy simultaneously with different agents of the system. An exception handler flags an exception during use of the collaborative agents in the relevant domain when the value of a variable for an agent conflicts with a relevant constraint. Alternatively, the exception handler flags an exception when the resource and time constraints cannot be met by allocation of tasks between the collaborative agents. Communities of software agents built within a system might be used to launch and/or manage telecommunications services or to control a chemical process, for example.

40 Claims, 12 Drawing Sheets



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(12) **United States Patent**
Salesky et al.

(10) **Patent No.: US 6,343,313 B1**
(45) **Date of Patent: *Jan. 29, 2002**

(54) **COMPUTER CONFERENCING SYSTEM WITH REAL-TIME MULTIPOINT, MULTI-SPEED, MULTI-STREAM SCALABILITY**

(75) Inventors: **Joseph Salesky**, Cameron Park; **Peter Madams**, Moraga; **John Flower**, Walnut Creek; **Clint Kaul**, San Mateo; **Benjamin Wells**, Walnut Creek; **Edward Arthur Ho-Ming Janne**, San Francisco, all of CA (US)

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(*) Notice: This patent issued on a continued prosecution application filed under 37 CFR 1.53(d), and is subject to the twenty year patent term provisions of 35 U.S.C. 154(a)(2).

Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

(21) Appl. No.: **08/823,744**

(22) Filed: **Mar. 25, 1997**

Related U.S. Application Data

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(58) **Field of Search** 709/204, 205, 709/207, 227, 228, 247, 242, 201, 202, 203, 206, 223, 224, 233, 232; 345/753, 751, 752, 764, 758, 505

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(57) **ABSTRACT**

An improved networked computer communications system handles arbitrary streams of data, and transports at varying speeds those streams where intermediate updates can be dropped if they are obsoleted by later arriving data updates, optimizing the utilization of network and node resources. Complex buffering by system server software allows distributed, parallel, or redundant processing, transmission, and storage for performance, reliability, and robustness. Various parameters of the system can be monitored, and the system can be reconfigured automatically based on the observations. Varied techniques reduce the perceived end-to-end latency and take advantage of software and hardware capabilities that assets connected to the system may possess. One conferencing system allows conference participants to share all or a portion of the display seen on their computer screens. The conferees may be at sites removed from each other, or may view a recorded presentation or archived conference at different times. Conference participants are either "presenters" who can modify the display or "attendees" who cannot modify the display. A pointer icon, which can be labeled to identify the conferee, is displayed on the shared image area. Each conferee can modify the position of his or her own pointer, even when not presenting, so that every participant can see what each conferee is pointing to, should a conferee choose to point to an element of the display. These and other features apply to other data streams shared in the conference or in meetings where there is no shared-image data stream.

12 Claims, 37 Drawing Sheets